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Collective intentionality and reciprocity

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Summary: In earlier works on the semantics of reciprocal verbs, it has often been assumed that the use of the collective guise of reciprocal verbs (e.g. "*Violet and Mark hugged"*) implies symmetric participation of both parties involved. However, recent work (Kruitwagen et al., 2017) suggests that this is not always the case. The use of the collective guise of reciprocal verbs is sometimes also accepted in situations of asymmetric participation and a factor that could be involved in this is collective intentionality: a shared intention, belief or emotion within the group of participants involved in the action. The experiment described in this thesis researches the role of collective intentionality on the acceptance of the use of the collective guise of reciprocal verbs in situations of asymmetric participation. This was done by collecting the truth-value judgements of Dutch speakers of sentences using such verbs in this way, based on a visually displayed situation that either involved collective intentionality or not. A positive effect of collective intentionality was found for five out of six tested verbs.

1. Introduction

The notion of reciprocity, which means that an action performed by an individual or a group A to an individual or a group B is returned from B to A, can be expressed in language through specific reciprocal verbs such as *hug*, *marry*, *fight* or *date*. These reciprocal verbs have a unary/collective (intransitive) guise, as in "Violet and Mark hugged", which is interpreted as a statement about both parties involved collectively, and a binary guise, such as in "Violet hugged Mark", that is usually either transitive or takes a prepositional phrase[1]. It is usually assumed that there is a sematic relationship between the binary and unary guise of these verbs, where the use of the unary guise would imply symmetric participation of both parties involved. "Violet and Mark hugged" would then mean that Violet hugged Mark and Mark hugged Violet back. However, recent work (Kruitwagen, 2017; Kruitwagen, Poortman and Winter, 2017) suggests that this is not always the case. In this study, the truth-value judgements of unary guises of reciprocal verbs were collected in situations where the participation of the parties involved was not symmetric. The acceptability of such sentences in these situations was hypothesized to be positively influenced by the display of collective intentionality: a shared intention, belief or emotion within the group of participants involved in the action (Searle, 1990; Kruitwagen et al., 2017).
The experiment discussed in this thesis looks further into the role of collective intentionality on the acceptability of the unary use of reciprocal verbs in situations of non-symmetric participation. This is done by comparing the acceptability rates in situations where collective intentionality is or is not displayed.

1.1. Reciprocity

As mentioned before, verbs that describe a reciprocal relation can have a collective/unary and a binary guise. Studies on the semantics of reciprocity have tried to describe this relationship between the unary and the binary guise. It is important to note that there are differences within the class of reciprocal verbs such as the ones mentioned before. If someone would say *Mark dated Violet*, it would be assumed that *Mark and Violet dated* and also that *Violet dated Mark*. The verb *date* is symmetrical in the way that the binary guise seems to entail the unary guise as well as the other way

[1] Note there is a difference between a binary guise that takes a prepositional phrase (for example: *Mark is talking to Violet*) and a so called *discontinuous reciprocal*, in which the subject of the reciprocal is split between the syntactic subject of the sentence and another part using a 'with-phrase' (Dimitriadis, 2004).

around. However, these relationships are different for a verb like *embrace*, which becomes clear from the example (Dong, 1970):

1) *a. The drunk embraced the lamppost.*
   b. #The drunk and the lamppost embraced.

Such examples have been attempted to be analysed in terms of transformational rules (Gleitman, 1965; Lakoff & Peters, 1966), volitional agents (Dowty, 1991) or thematic roles. However, these accounts have mostly assumed that in the use of the unary guise means that the participants act symmetrically. This assumption has been challenged by Kruitwagen et al. (2017) by testing the truth-value judgements of this collective guise of reciprocal verbs as opposed to the binary guise in situations of asymmetry, shown in visual stimuli (illustrations or video clips). The results of this experiment show that a substantial part of participants accepted such sentences in these situations. This would mean that symmetric participation is not a necessary requirement (although preferred) for the unary guise of these reciprocal verbs. They propose an account in which reciprocals are analysed in how prototypically reciprocal they are, assuming that such events can be categorized by relying on a graded notion of typicality. A reciprocal would be more generally accepted if it is more prototypically reciprocal. Symmetric participation and collective intentionality would influence how prototypical a reciprocal is.

1.2. Collective intentionality

The notion of collective intentionality is quite a philosophical issue. Although the term is almost explained in the term itself – collective intentionality means having a shared intention – it gets more philosophical when trying to touch upon what that actually means and how it can occur. The central issues in literature about collective intentionality are what is called the *Irreducibility Claim* and the *Individual Ownership Claim* (Swcheikard & Schmid, 2013). The Irreducibility Claim states that collective intentionality is more than just the summation of individual intentions of the participants. Individual Ownership, however, means that the intentions are had by individuals: there is not some sort of “collective mind” where collective intentionality occurs.
Searle (1990) tries to analyse collective intentionality given that it is not analysable as the sum of individual intentions of participants. Arguments given for this are that although a group of people might have the same intention, because they have the same goal in their actions for example, but that does not necessarily mean they have collective intentionality. If two people intend to visit the same place, even at the same time, that does not mean they intend to visit it together.
Apart from that, Searle mentions that if a group carries out an action with a collective intention, the individual intentions derived from this might not always have the same content as the collective intention. As an example: if a football team was playing a match and had the intention to score a goal or win a game, the individual roles of the players of the team could be very different. If one player has the task to defend a player from the other team, they might play a match focusing on their goal to so. This can be their part in the collective goal of the team to win the game, which is something they are also aware of. Not every player will perform the same actions in this shared goal. In other words, to have collective intentionality as an individual (Individual Ownership), the individual needs to be aware of that there is a shared intention of the group, but each person can play its own part in this.
This can also be relevant to the research presented in this thesis. For example, if two people are

having a conversation, one might sometimes take the role of 'listener' when the other takes the role of 'talker'. In this case, they have the intention to have a conversation, and you might still be able to say they are conversing, even though they are not always both talking. In this way, the fact that two people have a collective intention, might be relevant to whether a collective, reciprocal description of an action is accurate even if the two people are not performing the action in the same way. Although the notion of collective intentionality is quite abstract and philosophical, and the philosophical discussion related to the concept is not too relevant for the current research, this notion is taken to describe something that speakers can be aware of when judging or describing events. The idea that people have a shared intention could be presented more concretely through cues such as facial expressions and body language, which is what is done in the experiment to manipulate visually presented situations to show collective intentionality or not.
Shedding light on the influence of collective intentionality on the interpretation of reciprocity can be relevant in developing theories about the semantics of collectivity and reciprocity.

1.3. The current study

The current study is a follow up on the research done by Kruitwagen (2017), but differs from this research in a few ways. First of all, the current study looks specifically at the role of collective intentionality on the acceptance of the collective use of reciprocal verbs. The method that is used in this study, was also used by Kruitwagen, but only really tested in a pilot study, whereas the current study uses more participants. The current study uses a between-subjects design, in which half of the participants get to see half of the target stimuli and the other participants get to see the other half and no participant sees the same item twice. In the earlier research, this was sometimes the case that participants saw similar items twice.

The hypothesis for this experiment is that collective intentionality has a positive effect on the acceptability rates of the collective use of reciprocal verbs in situations of asymmetry. In other words, more participants would judge a sentence using the unary guise of a reciprocal verb to be true in a situation where one party is actively performing an action and the other is passive, if the passive participant of the action is showing collective intentionality. This is tested by letting participants judge sentences as true or false after showing them a video in which a situation such as described is displayed.

2. Method

2.1. Participants

The participants in this experiment were seventy native speakers of Dutch. They all reported to have not been diagnosed with dyslexia. All participants received monetary compensation for participating in the experiment.

2.2. Materials

Six Dutch reciprocal verbs were selected to be used in this experiment: *roddelen* ("to gossip"), *praten* ("to talk"), *botsen (tegen)* ("to collide (with)"), *fluisteren* ("to whisper"), *knuffelen* ("to hug") and *vechten* ("to fight"). For each of these verbs a sentence in which the verb was used in the collective guise (e.g. *Violet en Mark hebben geknuffeld* "Violet and Mark hugged") was tested on its acceptability in a given situation. The situations were acted out by two professional actors, one male

("Mark") and one female ("Violet"), in video clips that were shown to the participants. These videos included a situation in which one person (Violet) was "active", whilst the other (Mark) was "passive" in carrying out the action. For each of the target verbs, there was a video in which Mark and Violet did show collective intentionality and one in which they did not show collective intentionality (by means of facial expressions, body language and other social cues). Nine filler items and two secondary target items were also added to the experiment. The filler items were added to make sure participants were paying attention (if one would answer 'true' to an obviously false filler item, this participant might not be paying attention or answering seriously) and so that it would not be to obvious what the experiment was about. The secondary target items were for the verb *botsen*, and tested the binary guise of this verb rather than the collective guise (*Mark is tegen Violet gebotst* "Mark collided with Violet"). The same videos as for testing the collective guise were used for this. These control items were included, because the construction of the sentence was changed as opposed to earlier experiments (the auxiliary *zijn (*"to be") is now used instead of the auxiliary *hebben (*"to have"), because this seemed more natural to Dutch speakers). Although sentences in the binary guise were not included for any of the other target verbs, since this was not the focus of this experiment, they were included for *botsen* to make sure it would lead to the same results as in earlier experiments in which the auxiliary *hebben* was used (that did focus on the binary guise as well).

2.3. Order

To cancel out effects of seeing a similar video twice and being presented with the same sentence twice and to create a between-subjects design, the participants only got to see one video for each test verb, either the video with or without collective intentionality. To do this, two versions of the experiment were created, one of which included the videos that showed collective intentionality for half of the verbs and the ones that did not show collective intentionality for the other three verbs. The other version included the videos that were not shown in the first version. Half of the participants got to see first version and the other half got to see the second version of the experiment. The filler items were the same for all participants, and the order in which participants got to see the videos for each verb was also the same for both versions. The secondary target items were presented at the end of the experiment, so this wouldn't affect their answer on the test item for *botsen*, since in this case, the participants did see the same video as they saw before, but with a different sentence that they were asked to judge. The other items were presented in pseudo-randomized order (there were always filler items in-between target items).

2.4. Procedure

The participants individually sat in a soundproof booth in front of a computer while doing the experiment. The videos were displayed on the computer screen and after each video a sentence appeared on the screen. The participants were instructed to indicate whether they thought this sentence was true or false based on the displayed situation, by pressing the "w" (for "waar" = true) or the "o" (for "onwaar" = false) key on the keyboard. The participants were told that there were no correct or wrong answers in this experiment and that they should just trust their intuition. After showing the sixteen videos, the participants were asked to give confidence ratings on a scale from 1 (=not sure at all) to 5 (=very sure) of the answers they had given to the target sentences.

3. Results

3.1. Acceptance rates

Results of the experiment are shown in table 1.

Table 1. Percentages of participants that answered 'true' to the given statements including one of the target verbs, in depicted situations with or without collected intentionality (out of N=35 participants).

Verb	**% true responses with collective intentionality**	**% true responses without collective intentionality**
Roddelen ("gossip")	91,43	25,71
Praten ("talk")	34,29	14,29
Botsen ("collide")	82,86	80
Fluisteren ("whisper")	48,57	2,86
Knuffelen ("hug")	74,29	45,71
Vechten ("fight")	45,71	2,86

The acceptability rates varied between 34,29% ("*praten*") and 91,43% ("*roddelen*") for the video clips that showed a situation in which there was collective intentionality, and between 2,86% ("*fluisteren*" and "*vechten*") and 80% ("*botsen*") for items without collective intentionality.
The results were statistically analysed using a chi-square analysis, to test whether there would be a difference between the items with or without collective intentionality. The results of the chi-square analysis are shown in table 2. Since the hypothesis is that collective intentionality would have a positive effect on the acceptance rates, a one-sided analysis was used for all items except for "*botsen*", since for this verb the acceptance rates for the versions with and without collective intentionality were very close.

Table 2. Results chi-square analysis.

Verb	**Df**	**χ^2**	**p-value**	**95% confidence interval**
Roddelen ("gossip")	1	28.495	<0.001	0.484 - 1
Praten ("talk")	1	2.797	0.047	0.007 - 1
Botsen ("collide")	1	0	1	-0.182 - 0.239
Fluisteren ("whisper")	1	16.827	<0.001	0.282 - 1
Knuffelen ("hug")	1	4.821	0.014	0.073 - 1
Vechten ("fight")	1	15.228	<0.001	0.254 - 1

The results suggest that there is a significant difference in acceptability rates between situations in which collective intentionality is or is not shown for five out of six verbs. Only for "botsen" there is no significant difference in acceptance rates between the video clip with and the video without collective intentionality.

For the secondary target items for "botsen", where instead of the collective sentence "Violet en Mark zijn gebotst" (*Violet and Mark collided*), the binary sentence "Mark is tegen Violet gebotst" (*Mark collided with Violet*) was tested, the sentence got rejected by almost all participants both when the video clip showed collective intentionality and when it did not (1 out of 35 participants judged the sentence to be true in both cases).

3.2. Confidence ratings

Apart from judging sentences as true or false, participants were asked to indicate how sure they were of the answers they gave to the six target items they got to see. The results for this are summarized in table 3. Separate mean confidence ratings are given for participants that judged an item to be true and participants that judged it to be false.

Table 3. Means for confidence ratings

Item	**Mean confidence rating (N=35)**	**Mean confidence rating if answered 'true' *(N)***	**Mean confidence rating if answered 'false' *(N)***
Roddelen ("gossip") CI	4,31	4,5 *(32)*	2,33 *(3)*
Roddelen ("gossip") no CI	3,6	3,33 *(9)*	3,69 *(26)*
Praten ("talk") CI	3,94	4 *(12)*	3,91 *(23)*
Praten ("talk") no CI	4	3 *(5)*	4,17 *(30)*
Botsen ("collide") CI	4,23	4,34 *(29)*	3,4 *(6)*
Botsen ("collide") no CI	4	4,32 *(28)*	2,71 *(7)*
Fluisteren ("whisper") CI	3,8	3,47 *(17)*	4,11 *(18)*
Fluisteren ("whisper") no CI	4,26	3 *(1)*	4,29 *(34)*
Knuffelen ("hug") CI	4,09	4,19 *(26)*	3,78 *(9)*
Knuffelen ("hug") no CI	3,57	3,75 *(16)*	3,42 *(19)*
Vechten ("fight") CI	3,77	4,06 *(16)*	3,53 *(19)*
Vechten ("fight") no CI	4,26	4 *(1)*	4,26 *(34)*

On average the confidence ratings vary between 3,57 (for *knuffelen* without collective intentionality) and 4,31 (for *roddelen* with collective intentionality). Although this has not been statistically tested, on first glance it seems like the confidence ratings follow patterns in acceptance ratings in a way: people seem more sure of their answers on items where there is also less variation in acceptance rates (where most people clearly answered either true or false).
Because sometimes only a very small group of participants judged a particular item to be true or false, it is hard compare the confidence ratings for 'true' and 'false' answers.

4. Discussion

The results of the experiment are in line with the hypothesis that collective intentionality has a positive influence on acceptance rates of the collective guise of reciprocal verbs in situations where there is no symmetry. Results of the chi-square analysis show a significant difference in acceptance rates between situations where there is or there is no collective intentionality for five out of six tested reciprocal verbs. More people accepted the target sentences to be true if the situation they saw acted out involved collective intentionality. Only for the verb *botsen* ("collide"), there was no difference between the items with and without collective intentionality.

There are differences between the verbs, which is seen in the 95 percent confidence intervals, for example. These 95 percent confidence interval would suggest smaller effects of collective

intentionality on verbs like *praten* and *knuffelen* and somewhat larger effects on *roddelen*, *fluisteren* and *vechten*. A verb like *praten* (“talk´) has a 95 percent confidence interval of [0.007, 1]. This means that although the results show a significant difference in acceptance rates for collective intentionality, this difference might in reality be smaller than in in the sample. The effect of collective intentionality for *praten* could only be as small as 0,07 percent. For *roddelen* (“gossip”) on the other hand, there is a much more clear effect of collective intentionality, with a 95 percent confidence interval of [0.48, 1].

Differences between verbs can also be observed just by looking at acceptance rates. For both *vechten* (“fight”) and *fluisteren* (“whisper”), only one participant accepted the sentence as true when there was no collective intentionality. The other verbs, however, were still judged to be true by more participants even when there was no collective intentionality. For *knuffelen* for example, this was still 45,71 percent, which is comparable to the acceptance rates for *vechten* and *fluisteren* when there was collective intentionality.
The results suggest that there might be differences between effects of collective intentionality for different verbs, and perhaps also other properties of verbs that make up for differences in acceptance rates. For example, there might not be an effect of collective intentionality on *botsen*, because colliding is not something one would usually do intentionally.

The confidence ratings were not analysed statistically and the differences in confidence ratings don’t seem very big on first glance, but they might also shed more light on how people judged the sentences. If the majority of people judged a sentence to be true and give a high confidence rating for this, whereas the people who judged the sentence to be false have a lower confidence rating, this might make an even stronger claim for the fact that the sentence would mostly be judged to be true. However, because of the small amount of ‘true’ or ‘false’ answers on some of the items, it is hard to reliably analyse these differences.

One point of discussion that has not been accounted for in this experiment, is that collective intentionality could also be of influence on the interpretation of the binary guise. In Kruitwagen et al. (2017) the binary guise of *knuffelen* (as in *Mark heeft Violet geknuffeld* “Mark has hugged Violet”, in a situation of asymmetry where Violet hugs Mark, but with the collective intention of Mark), for example, was still judged as true by 31 percent and 28 percent of the participants in the two experiments described in this paper. In another related experiment about 40 percent of participants even judged the binary guise of *knuffelen* to be true in such a scenario, which is quite a substantial part. If the displayed situations were truly perceived as asymmetric, an acceptance rate of 0 percent would actually be expected here. The fact that this is not the case, could suggest that collective intentionality also influences the acceptance rates for the binary usage of reciprocal verbs.
If this is true, because of the relationship between the binary and the collective guise, it would be necessary to compare the collective to the binary guise to be able to estimate the effect of collective intentionality. Differences for situations with or without collective intentionality for the binary guise would have to be compared to differences for the collective guise. As of so far, however, no data has been collected of truth-value judgements of sentences involving these verbs in the binary guise for situations where there was no collective intentionality. These would have to be collected in further research.
The only verb for which there have been give truth-value judgements for the binary guise in this experiment, is *botsen*. However, both with and without collective intentionality, this binary guise

sentence was judged to be false by almost all participants and as we have seen there is no effect of collective intentionality on the collective guise for *botsen* either. This would just suggest that in the case of *botsen*, symmetric participation is not necessary for the collective guise to be judged as true by the majority of speakers.

To conclude, the results of the experiment presented in this thesis are in line with the hypothesis that collective intentionality has a positive effect on the acceptability rates of the collective use of reciprocal verbs in situations of asymmetry, which would suggest that there is an effect of collective intentionality on the interpretation of reciprocal verbs. Significant results have been found for the verbs *roddelen*, *praten*, *fluisteren*, *knuffelen* and *vechten*, but not for *botsen*.

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Attachments

1. *Stimuli version 1*

type	verb	construction	expected anwer	sentence	CI or no CI
filler	dezelfde taal praten	unary	vague	Mark en Violet spreken dezelfde taal.	
target	roddelen	unary	vague	Violet en Mark hebben geroddeld.	CI
filler	spelen	unary	true	Mark en Violet hebben boter-kaas-en-eieren gespeeld.	
filler	afscheid nemen	binary	true	Mark heeft afscheid genomen van Violet.	
target	praten	unary	vague leaning towards 'false'	Violet en Mark hebben gepraat.	no CI
filler	eten	unary	false	Violet en Mark hebben gegeten.	
filler	flirten	binary	true	Mark heeft met Violet geflirt.	
target	botsen	unary	vague	Violet en Mark zijn gebotst.	CI
filler	schoppen	binary	false	Mark heeft Violet geschopt.	
target	fluisteren	unary	vague leaning towards 'false'	Violet en Mark hebben gefluisterd.	no CI
filler	ruzie maken	unary	true	Violet en Mark hebben ruzie gemaakt.	
target	knuffelen	unary	vague	Violet en Mark hebben geknuffeld.	CI
filler	bellen	binary	false	Mark heeft Violet gebeld.	
filler	kussen	unary	vague	Violet en Mark hebben gekust.	
target	vechten	unary	vague leaning towards 'false'	Violet en Mark hebben gevochten.	no CI
control	botsen	binary	false	Mark is tegen Violet gebotst.	CI

2. *Stimuli version 2*

type	verb	construction	expected answer	sentence	CI or no CI
filler	dezelfde taal praten	unary	vague	Mark en Violet spreken dezelfde taal.	
target	roddelen	unary	vague leaning towards ‘false’	Violet en Mark hebben geroddeld.	no CI
filler	spelen	unary	true	Mark en Violet hebben boter-kaas-en-eieren gespeeld.	
filler	afscheid nemen	binary	true	Mark heeft afscheid genomen van Violet.	

target	praten	unary	vague	Violet en Mark hebben gepraat.	CI
filler	eten	unary	false	Violet en Mark hebben gegeten.	
filler	flirten	binary	true	Mark heeft met Violet geflirt.	
target	botsen	unary	vague leaning towards 'false'	Violet en Mark zijn gebotst.	no CI
filler	schoppen	binary	false	Mark heeft Violet geschopt.	
target	fluisteren	unary	vague	Violet en Mark hebben gefluisterd.	CI
filler	ruzie maken	unary	true	Violet en Mark hebben ruzie gemaakt.	
target	knuffelen	unary	vague leaning towards 'false'	Violet en Mark hebben geknuffeld.	no CI
filler	bellen	binary	false	Mark heeft Violet gebeld.	
filler	kussen	unary	vague	Violet en Mark hebben gekust.	
target	vechten	unary	vague	Violet en Mark hebben gevochten.	CI
control	botsen	binary	false	Mark is tegen Violet gebotst.	no CI